GB

MOISTURE ANALYSERS

2015

KERN Pictograms

Internal adjusting:
Quick setting up of the balance's accuracy with internal adjusting weight (motordriven).

Adjusting program CAL:
For quick setting up of the balance's accuracy. External adjusting weight required.

Memory:
Balance memory capacity, e.g. for article data, weighing data, tare weights, PLU etc.

Data interface RS-232:
To connect the balance to a printer, PC or network.

RS-485 data interface:
To connect the balance to a printer, PC or other peripherals. High tolerance against electromagnetic disturbance.

USB data interface:
To connect the balance to a printer, PC or other peripherals.

Bluetooth data interface:
To transfer data from the balance to a printer, PC or other peripherals.

WLAN data interface:
To transfer data from the balance to a printer, PC or other peripherals.

Control outputs (optocoupler, digital I/O):
To connect relays, signal lamps, valves, etc.

Interface for second balance:
For direct connection of a second balance.

Network interface:
For connecting the scale to an Ethernet network. With KERN products you can use a universal RS-232/LAN converter.

GLP/ISO log:
The balance displays the weight, date and time, regardless of a printer connection.

GLP/ISO log:
With weight, date and time. Only with KERN printers, see "Accessories"

Piece counting:
Reference quantities selectable. Display can be switched from piece to weight.

Recipe level A:
Separate memory for the weight of the tare container and the recipe ingredients (net total).

Recipe level B:
Internal memory for complete recipes with name and target value of the recipe ingredients. User guidance through display.

Recipe level C:
Internal memory for complete recipes with name and target value of the recipe ingredients. User guidance through display. Additional convenient functions, such as barcode and back calculation functions.

Totalising level A:
The weights of similar items can be added together and the total can be printed out.

Totalising level C:
Internal memory for complete recipes with name and target value of the recipe ingredients. User guidance through display. Additional convenient functions, such as barcode and back calculation.

Percentage determination:
Determining the deviation in % from the target value (100 %).

Weighing units:
Can be switched to e.g. nonmetric units at the touch of a key. See balance model. Please refer to KERN's website for more details.

Weighing with tolerance range:
Upper and lower limiting values can be programmed individually for e.g. dosing, sorting and portioning.

Vibration-free weighing:
(Animal weighing program)
When the weighing conditions are unstable, a stable weight is calculated as an average value.

Protection against dust and water splashes IPxx:
The type of protection is shown in the pictogram. For details see the glossary.

ATEX explosion protection:
Suitable for use in hazardous industrial environments, in which there is explosion danger. The ATEX marking is specified for each device.

Stainless steel:
The balance is protected against corrosion.

Suspended weighing:
Load support with hook on the underside of the balance.

Battery operation:
Ready for battery operation. The battery type is specified for each device.

Rechargeable battery pack:
Rechargeable set.

Mains adapter:
230V/50Hz in standard version for EU. On request GB, AUS or USA version available.

Power supply:
Integrated in balance. 230V/50Hz standard EU. More standards e.g. GB, AUS or USA on request.

Strain gauges:
Electrical resistor on an elastic deforming body.

Tuning fork principle:
A resonating body is electromagnetically excited, causing it to oscillate.

Electromagnetic force compensation:
Coil inside a permanent magnet. For the most accurate weighings.

Single cell technology:
Advanced version of the force compensation principle with the highest level of precision.

Verification possible:
The time required for verification is specified in the pictogram.

DAkkS calibration possible:
The time required for DAkkS calibration is shown in days in the pictogram.

Package shipment:
The time required for internal shipping preparations is shown in days in the pictogram.

Pallet shipment:
The time required for internal shipping preparations is shown in days in the pictogram.

Warranty:
The warranty period is shown in the pictogram.

KERN – measuring technology and testing services from a single source

Balances & Test service catalogue

Provides a complete overview of the KERN line of balances, test weights, and services.

Medical scales catalogue

Complete line of medical scales, from infant scales to professional patient scales, chair scales and adiposity scales, as well as innovative hand grip dynamometres, chemist's balances, and veterinary scales.

Microscopes & refractometers catalogue

Extensive range in the area of optical instruments, such as, for example, biological microscopes, stereo microscopes, metallurgical microscopes, polarisation microscopes as well as analogue and digital refractometers.

SAUTER measuring equipment catalogue

Test instruments for industry and commerce, such as force, coating thickness, material thickness, and hardness measuring systems.

KERN DAkkS calibration service brochure

Detailed information on topics pertaining to the calibration of balances, test weights, and force measuring devices.

KERN branch prospectuses

Compact overview of the best-sellers for many different lines of business – just the balances your customers need!

The gnome guide

Travel report from KERN, the famous scientific gnome, who travelled all over the world, in order to illustrate the physical law of gravitational force. Ideal for use in school education – please request, it's free of charge.

170 years of KERN

Interesting and readable overview of the history of the origins of Southern German balance manufacturing, as well as the company history, which stretches right back to 1770 – please request, it's free of charge.

Your advantages

Quick Delivery
Items in stock are sent the same day if orders are placed before 1:00 pm (valid for parcel service delivery within the EC).

Price performance ratio
KERN scales are always an inexpensive alternative. They are durable, uncomplicated and easy to place into operation.

Direct dispatch
of ordered goods to your customer is available, with personalised delivery note if desired (please ask), invoice will be issued to you (third party business).

3 years warranty
Items under € 400,–

No stock-keeping necessary.
KERN does the warehousing for you.

Sale or return
within 14 days of purchase.

Moisture analysers

DBS 53
Modern moisture analyser with 10 memories and graphic display

DLB 54
Robust moisture analyser for samples up to 160 g

MLB-C · MLS-C 55
Moisture analysis in an instant:
Infrared moisture analyser with graphic display and a high capacity memory

DLT-N 56
High-end moisture analyser with touch-sensitive tablet and innovative Android® operating system

Moisture analysing is an integral part of production and processing many raw and finished products and has a crucial impact on the quality of the product.

Moisture analysers are used particularly in the food industry, water resource management (sewage plants, etc.), plastics industry, agriculture and the energy industry (bio-energy plants, etc.).

Determining moisture requires a great deal of experience. Depending on the type of sample and the task involved, various drying processes are used.

KERN has concentrated on the most widely-used drying method: halogen drying, which brings many advantages:

- Sample is evenly warmed from above, without risk of burning the sample surface
- Affordable purchase costs ensure rapid amortisation of the device
- Most common temperature ranges from 35 – 200 °C
- High measuring precision, up to 0.01 %
- Sufficient buffer capacity, weighing range up to 160 g
- Various drying programs (gentle drying, standard drying, gradual drying, rapid drying (Boost))

The numerous memories of the KERN moisture analyser are particularly useful, as they hold information on the complete drying processes with drying parameters such as drying time, drying period, drying temperature, display settings, switch off criteria, etc. This saves an enormous amount of time and helps to achieve repeatable results.

On the internet, you will find a practical application handbook containing many examples, field reports, settings and tips for each KERN moisture analyser.

Your KERN product specialist will be happy to help:

Ulrich Ulmer
Product specialist Moisture analysers

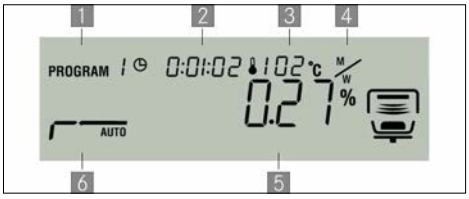
Tel. +49 [0] 7433 9933 - 160
Fax +49 [0] 7433 9933 - 29160
ulmer@kern-sohn.com

Quick-Finder Moisture analysers

Read-out [d]	Weighing range [Max]	Model KERN	Price excl. of VAT ex works €	Page	DAYS ready for shipping	CAL EXT	MEMORY	RS 232
						For an explanation on the pictos, see the front flap		
0,001 g	50 g	**MLB 50-3C**	**1220,-**	55	1	●	○	○
0,001 g	50 g	**MLS 50-3C**	**1550,-**	55	1	●	○	○
0,001 g	60 g	**DBS 60-3**	**1140,-**	53	1	●	○	○
0,001 g	160 g	**DLB 160-3A**	**1200,-**	54	1	●	○	○
0,001 g	160 g	**DLT 100-3N**	**2200,-**	56	1	●	○	○

● = Standard ○ = Option

Moisture analyser KERN DBS



04

Modern moisture analyser with 10 memories and graphic display

STANDARD

CAL EXT · MEMORY · RS 232 · GLP PRINTER · UNIT · 230 V · N I S FORCE · 1 DAY · 3 YEARS WARRANTY

OPTION

USB · DAkkS +3 DAYS

KERN	DBS 60-3
Readout [d]	0,001 g / 0,01 %
Weighing range [Max]	60 g
Reproducibility, weight of sample 2 g	0,15 %
Reproducibility, weight of sample 10 g	0,02 %
Display after drying (Display switchable at all times)	
Moisture [%] = Moisture con tent (M) from wet weight (W)	0 - 100 %
Dry content [%] = Dry weight (D) from (W)	100 - 0 %
ATRO [%] [(W-D) : D] · 100%	0 - 999 %
Moisture content [g] (M)	Absolute value in [g]
Temperature range	50 - 200 °C in steps of 1 °C
Drying modes	Standard drying Gradual drying Gentle drying Rapid drying
Switch off criteria	• When the set time has expired 1 min - 4 h • When the weight loss per unit of 157 f.
Call up of measurement	Interval can be set from 1 sec - 10 min (Only when used with printer KERN YKB-01N or PC)
Overall dimensions WxDxH	202x336x157 mm
Net weight	approx. 4,2 kg
Price €, excl. of VAT, ex works	1140,-
Option DAkkS Calibr. Certificate	963-127, € 72,-

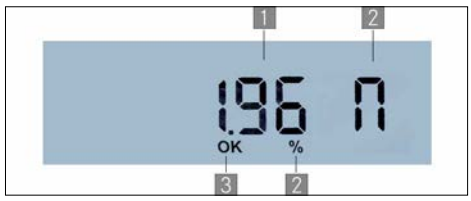
Features

- Backlit LCD display, digit height 15 mm
  - Drying program
  - Previous drying time
  - Current temperature
  - Unit of the shown result, e.g. moisture [%]
  - Current moisture content in %
  - Drying mode/Status display drying
- **Halogen quartz glass heater** 400 W
- **Observation window above the sample,** useful during initial setting
- **Internal memory** for automatic run of 10 drying programs and 100 drying processes already executed
- The last value measured remains on the display until it is replaced by a new measurement
- **Sample description** for up to 99 samples, 2 digits, freely programmable, and printed in the measuring protocol
- **Date and time display** as standard
- **10 sample plates included**
- **Application handbook:** On the internet, you will find a practical application handbook containing many examples, field reports, settings and tips for each KERN moisture analyser

Accessories

- **Sample plates aluminium,** Ø 92 mm. Box with 80 pieces, KERN MLB-A01, **€ 60,-**
- **Round fiberglass filter** e. g. for samples that splash or become encrusted. Box with 80 pieces, KERN RH-A02, **€ 80,-**
- **Temperature calibration set** consists of measuring sensor and display device, KERN DBS-A01, **€ 420,-**
- **USB interface kit** for bi-directional data exchange between moisture analyser and computer. Scope of delivery: USB cable, driver, Software Balance Connection, KERN DBS-A02, **€ 290,-**
- **Suitable printers** see page 157 ff.

Moisture analyser KERN DLB



Robust moisture analyser for samples up to 160 g

STANDARD

CAL EXT | MEMORY | RS 232 | GLP PRINTER | UNIT | 230 V | DMS | 1 DAY | 3 YEARS WARRANTY

OPTION

DAkkS +3 DAYS

KERN	DLB 160-3A
Readout [d]	0,001 g / 0,01 %
Weighing range [Max]	160 g
Reproducibility, weight of sample 10 g	0,05 %
Display after drying (Display switchable at all times)	
Moisture [%] = Moisture content (M) from wet weight (W)	0 - 100 %
Dry content [%] = Dry weight (D) from (W)	100 - 0 %
ATRO [%] [(W-D) : D] · 100%	0 - 999 %
Moisture content [g] (M)	Absolute value in [g]
Temperature range	35 °C - 160 °C in steps of 1 °C
Drying modes	Standard drying Rapid drying, Pre-heat level, can be switched on
Switch off criteria	• When the set time has expired 1 min - 99 min • When the weight loss per unit of time (60 sec) falls below the target value
Call up of measurement	• Continuous output (residual weight) • At the end of the drying process, manual or automatic (only in connection with KERN YKB-01N printer or PC)
Overall dimensions WxDxH	210x340x225 mm
Net weight value	approx. 4,2 kg
Price €, excl. of VAT, ex works	**1200,-**
Option DAkkS Calibr. Certificate	963-127, **€ 72,-**

Features

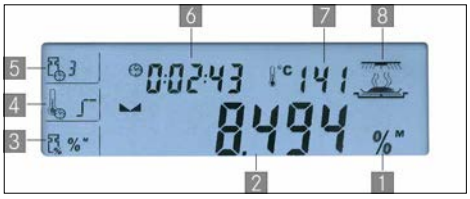
- Backlit LCD display, digit height 17 mm
  - Current moisture content in %
  - Unit of the shown result, e.g. moisture [%]
  - Drying process active
- **Halogen quartz glass heater** 400 W
- **Internal memory** for automatic run of 5 complete drying processes
- The last value measured remains on the display until it is replaced by a new measurement
- **10 sample plates included**
- **Application handbook:** On the internet, you will find a practical application handbook containing many examples, field reports, settings and tips for each KERN moisture analyser

Accessories

- **Sample plates aluminium,** Ø 92 mm. Box with 80 pieces, KERN MLB-A01, **€ 60,-**
- **Round fiberglass filter** e. g. for samples that splash or become encrusted. Box with 80 pieces, KERN RH-A02, **€ 80,-**
- **Temperature calibration set** consists of measuring sensor and display device, KERN DLB-A01, **€ 390,-**
- **Protective working cover** standard, can be retrofitted, KERN ALJ-A01, **€ 25,-**
- **Suitable printers** see page 157 ff.

KERN MLB-C

KERN MLS-C



KERN MLB-C

KERN MLS-C

Moisture analysis in an instant: Infrared moisture analyser with graphic display and a high capacity memory

Features

- Backlit graphic display, digit height 14 mm
- **Infrared heater** 400 W
- **Internal memory** for automatic run of complete drying programs (MLB-C: 20, MLS-C: 100) and 100 drying processes already executed (only MLS-C), which can be called up individually
- The last value measured remains on the display until it is replaced by a new measurement
- The large ventilation slots in the heating cover combined with the sample viewing window in form of a metal grid, ensure that moisture exhausts quickly which leads to shorter drying times
- Drying programs with optimised drying characteristics for rapid sample warming and therefore shorter drying times
- **10 sample plates included**
- **Application handbook:** There are many practical examples in the user manual

STANDARD

CAL EXT · MEMORY · RS 232 · GLP INTERN · UNIT · 230 V · FORCE · 1 DAY · 3 YEARS WARRANTY

OPTION

DAkkS +3 DAYS

KERN	MLB 50-3C	MLS 50-3C
Readout [d]	0,001 g / 0,01 %	
Weighing range [Max]	50 g	
Reproducibility, weight of sample 2 g	0,24 %	
Reproducibility, weight of sample 10 g	0,04 %	
Display after drying (Display switchable at all times)		
Moisture [%] = Moisture content (M) from wet weight (W)	0 - 100 %	
Dry content [%] = Dry weight (D) from (W)	100 - 0 %	
ATRO [%] [(W-D):D] · 100%	0 - 999 %	
Residual weight [g]	Absolute value in [g]	
Temperature range	40 °C - 160 °C in steps of 1 °C	
Drying modes	Standard drying · Gentle drying · Gradual drying · Rapid drying	
Switch off criteria	• When the set time has expired (1 min - 9 h 59 min) • When a constant weight per adjustable time unit has been reached (10 - 120 sec)	• When the set time has expired (1 min - 99 h 59 min) • When loss in weight per unit of time falls below the target value, both values freely programmable ([mg/sec])
Call up of measurement, interval adjustable	1 - 180 sec (only in connection with KERN YKB-01N printer or PC)	1 - 300 sec (only in connection with KERN YKB-01N printer or PC)
Overall dimensions WxDxH	206x333x192 mm	
Net weight	approx. 5,1 kg	
Price €, excl. of VAT, ex works	**1220,-**	**1550,-**
Option DAkkS Calibr. Certificate	963-127, **€ 72,-**	

- Unit of the shown result, e.g. moisture [%]
- Current moisture content in %
- Printout in moisture %
- Drying mode *Standard*
- Switch off criteria
- Previous drying time
- Current temperature
- Drying process active

only MLS-C:

- Printer interval 30 sec
- Status bar
- Target temperature

in addition with KERN MLS-C:

- **Simple „step-by-step" user guidance in the display** in the following languages DE, GB, FR, IT, ES, PL
- Graphic display of the drying curve shows the progress of the drying process in real time and can be used by the operator to check and evaluate the result
- **Practical weighing assistance** to arrive at a defined target value [g] with an adjustable tolerance range of 1 - 25 % of the target value

Accessories

- **Sample plates aluminium,** Ø 92 mm. Box with of 80 pieces, KERN MLB-A01, **€ 60,-**
- **Round fiberglass filter** e. g. for samples that splash or become encrusted. Box with of 80 pieces, KERN RH-A02, **€ 80,-**
- **Temperature calibration set** consists of measuring sensor and display device, KERN MLB-A12, **€ 590,-**
- **Protective working cover** standard, can be retrofitted, KERN ALS-A02, **€ 25,-**
- **Thermal printer**, KERN YKB-01N, **€ 355,-**

Moisture analyser KERN DLT-N

High-end moisture analyser with touch-sensitive tablet and innovative Android® operating system

Features

- **Innovative touchscreen:** Touch-sensitive, backlit LCD touch tablet with very good contrast for easy operation and convenient reading
- **Clear menu structure with plain text captions on the display.** The menu and processes are self-explanatory. This reduces training times, avoids operating errors and in this way, ensures a more efficient functionality
- **High mobility thanks to tablet operation,** data is available any time, anywhere
- **High-performance Android® operating system**
- **Lots of memory** for your applications
- **Memory for automatic run of 300 complete drying processes** (12 free digits per memory) and 100 drying processes already executed, which can be called up individually

STANDARD

CAL EXT | MEMORY | RS 232 | BT | GLP PRINTER | UNIT | 230 V | 230 V | DMS | 1 DAY | 3 YEARS WARRANTY

OPTION

DAkkS +3 DAYS

KERN	DLT 100-3N
Readout [d]	0,001 g | 0,01 %
Weighing range [Max]	160 g
Reproducibility, weight of sample 10 g	0,001 g
Display after drying (Display switchable at all times)	
Moisture [%] = Dry content [%] = Moisture content (M) from wet weight (W)	0 - 100 %
Dry content [%] = Dry weight (D) from (W)	100 - 0 %
ATRO [%] [(W-D):D] · 100%	0 - 999 %
Moisture content [g] (M)	Absolute value in [g]
Temperature range	35 °C - 160 °C in steps of 1 °C
Drying modes	Standard drying Gradual drying Gentle drying Rapid drying
Switch off criteria	• When the set time has expired (1 - 99 min) • When the weight loss per unit of time (60 sec) falls below the target value
Call up of measurement	• At the end of the drying process, manual or automatic (only in connection with KERN YKC-01)
Dimensions Moisture analyser WxDxH	210x340x225 mm
Dimensions Tablet BxTxH	195x120x10 mm
Net weight	approx. 4,5 kg
Price €, excl. of VAT ex works	**2200,-**
Option DAkkS Calibration Certificate	963-127, **€ 72,-**

- **Practical weighing assistance** to arrive at a defined target value [g] with an adjustable tolerance range of 1 – 25 % of the target value
- **10 sample plates included**
- **Wireless connection to a Bluetooth printer** allows for the printing of weighing data and drying curves for archiving purposes
- **Halogen quartz glass heater** 400 W
- **Colour LCD Display**, digit height 12 mm, screen diagonal 7" (approx. 178 mm), all information at a glance:
  1 Drying process active
  2 Status information, available for display
  3 Current moisture content in %
  4 Current temperature
  5 Android®-specific navigation elements
  6 Drying rate
  7 Switch off mode
  8 Drying type *Standard*
  9 Target temperature
  10 Current display and print-out of moisture-%
  11 Graphic display of the drying curve shows the progress of the drying process in real time and can be used by the operator to check and evaluate the result

Accessories

- **Sample plates aluminium**, Ø 92 mm. Box with 80 pieces, KERN MLB-A01, **€ 60,-**
- **Round fiberglass filter** e.g. for samples that splash or become encrusted. Box with 80 pieces, KERN RH-A02, **€ 75,-**
- **Temperature calibration set** consisting of measuring sensor and display device, incl. transport case, KERN DLB-A01, **€ 350,-**
- **Protective working cover** standard, can be reordered, KERN ALJ-A01, **€ 25,-**
- 12 **Bluetooth thermal printer,** suitable for wireless connection to compatible, Bluetooth-enabled moisture analysers, balances, dynamometers etc., see page 157, KERN YKC-01, **€ 690,-**

Tradition and innovation for more than 170 years

An independent family business, KERN since already 6 generations is synonymous with quality and reliability in customer service.

▸ 1844

KERN is founded – precision balances are produced

▸ 1863

A proud Gottlieb Kern with his staff

▸ 1880

Pharmaceutical balance with Aesculap

▸ 1923

Inflation – KERN wages are paid with self printed currency

▸ 1980

The electronic balance ousts mechanical devices

▸ 1994

Accredited DKD laboratory (ISO 17025)

▸ 2000

New premises in Balingen

▸ 2002

Existing QM system certification in accordance with DIN EN ISO 9001:2000 standards

▸ 2007

Approval for the manufacture of medical products (DIN EN 13485 and 93/42/EEC)

▸ 2008

Authorisation for initial verification by the manufacturer (2009/23/EC)

▸ 2009

Approval for the manufacture and sale of height rods (DIN EN 13485 and 93/42/EEC)

▸ 2012

New customer portal www.kern-sohn.com goes live

▸ 2013

Starting construction of Ziegelei 2.0 with computer-controlled high-bay warehouse

▸ 2014

Expansion of the product range to include optical instruments (microscopes and refractometers)

Our Tip

Come to see the Museum of scale and weight ...

How a scale learned to weigh! Come and experience KERN history in the Zollernschloss at Balingen ...

www.balingen.de
➔ Kultur

Printed in Germany
by KERN & SOHN GmbH
z-cb-gb-kp-201501

KERN – Tradition and Innovation for over 170 years

An independent family business, KERN since already 6 generations is synonymous with quality and reliability in customer service.

fast

- 24 hours delivery service – ordered today, on its way tomorrow
- Sales & service hotline available from 8:00 am to 6:00 pm

reliable

- 3 years warranty for balances over € 400,–
- Precision in weighing technology for more than 170 years

competent

- DAkkS accreditation DIN EN ISO/IEC 17025
- Certified QM system DIN EN ISO 9001:2008
- Authorisation for initial verification by the manufacturer 2009/23/EC
- Medical certifications DIN EN ISO 13485 and 93/42/EEC

versatile

- One-stop shopping: from pocket balances through to floor scales – everything from one supplier
- Find the product you want at lightning speed with the “Balance Quick-Finder” at www.kern-sohn.com

Order hotline
+49 [0] 7433 9933-0

Online-Shop
www.kern-sohn.com

Our team of consultants will assist you
from Monday to Friday
from 8:00 am to 6:00 pm

Service hotline
+49 [0] 7433 9933-199

E-mail order
info@kern-sohn.com

www.kern-sohn.com
For product specification sheets, user manuals, useful information, technical glossary pictures and much more as well as a smart search engine for test weights and balances

Calibration hotline
+49 [0] 7433 9933-196

Fax Order
+49 [0] 7433 9933-146

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Quality Management ISO 9001:2008

APPROVAL FOR MANUFACTURE OF MEDICAL PRODUCTS EN 13485 and 93/42/EEC

AUTHORISATION FOR INITIAL VERIFICATION BY THE MANUFACTURER 2009/23/EC

German Excellence Group
Member